Identifying and Facilitating the Upgrade Or Replacement of Substandard Subsurface Disposal Systems

A Report to the Maine Legislature's Joint Standing Committee

On Natural Resources

Submitted by
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For the

Maine Department of Environmental Protection and
The Maine Department of Human Services

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Introduction

In April 1998, the 118th Maine Legislature enacted 1998 . L. Chapter 748, "An Act to Reduce Nonpoint Source Pollution from Existing Sources, Amend the Shoreland Zoning Laws and Amend the Site Location of Development Laws." That law, in part, required the Department of Environmental Protection to consult with interested persons and relevant state agencies, and report back to the joint standing committee of the Legislature having jurisdiction over natural resource matters by January 15, 1999, as follows:

> "2. The department shall submit a report, in cooperation with the Department of Human Services, that includes an evaluation of options and recommendations for identifying and facilitating the upgrade or replacement of substandard subsurface disposal systems. The report must include a recommendation on whether a program for identifying and upgrading or replacing substandard disposal systems should be limited to systems located in the shoreland zone associated with great ponds or should include other shoreland areas, particularly those abutting clam flats and other shellfish harvesting areas."

The Department developed this report in accordance with the above mandate. To assist in its preparation, the Department convened a stakeholder in July. This group included members from local and state agencies, as well as business and environmental interest groups. An initial meeting was held on July 23rd, at which the Department presented a draft proposal for an inspection program. A revised draft of the proposal was discussed at a follow-up meeting on September 11th and led to further modifications, which were then distributed to work group members in a draft dated 9/18/98. Based on strong opposition from several stakeholders, including the Maine Association of Site Evaluators in comments dated October 13, 1998, DEP and DHS dropped the recommendation for a mandatory inspection program and replaced it with a recommendation for information disclosure to prospective buyers of property with subsurface disposal systems.

Assessing the Need: A Summary of Information Concerning Problems Associated with Subsurface Disposal Systems

Types of System Failures

There are generally two types of failure associated with subsurface wastewater disposal systems: Hydraulic failure and lack of attenuation in the soil of contaminants, including nitrates, phosphorus, bacteria and viruses, dissolved metals, detergents and solvents.

Hydraulic failure occurs when the soil cannot handle the volume of wastewater, and as a result, sewage flows onto the ground or backs up into the house. Causes of hydraulic failure include locating the system

in or too close to the high groundwater table, inadequate sizing of the system for the wastewater load, failure to pump out the septic tank, and encroachment of tree and bush roots into the system.

Lack of attenuation of contaminants occurs when there is a lack of fine soil particles for the effluent to pass through before reaching groundwater or surface water. This is often the case with systems located on very coarse, sandy soil, or directly on bedrock. In these cases, there is usually no visible evidence of system failure. The result, however, is that untreated effluent will continually contaminate the receiving water just as if the effluent were piped directly into the water.

Studies of System Performance

Department of Human Services, Division of Health Engineering

To date, there has not been a comprehensive evaluation of how big a problem exists due to subsurface disposal systems in the State of Maine, particularly concerning systems that pre-date 1974. There have been limited studies by several state agencies, including the Department of Human Services, Division of Health Engineering (DHS-HE); the Department of Marine Resources (DMR); and the Department of Environmental Protection (DEP).

In 1974, Maine discontinued using percolation tests in favor of site evaluations that classified sites in terms of one of 11 general soil profiles and one of five general soil condition classes. In 1984, DHS-HE reviewed plumbing permits to evaluate the performance of 60,826 systems installed during that ten-year period. Those findings were published in the 'Proceedings of the Fourth National Symposium on Individual and Small Community Sewage Systems" published by the American Society of Agricultural Engineers (LCCN 85-70629).

In 1994, DHS-HE again conducted this review. DHS –HE found that systems located on marine silts and clays are more likely to have been replaced than those located on other soils, and that systems located on poorly to very poorly drained soils are more likely to have been replaced that systems located on better drained soils.

According to 1990 census data, in 1990 there were 301,373 subsurface systems operating in Maine. DHS-HE records indicate that approximately 123,000 system permits were issued between 1974 and 1990, leaving the total number of pre-1974 systems at approximately 178,000. Based on statistical analysis of data from DHS-HE's studies, 25% of these systems, or approximately 44,500 systems are probably malfunctioning.

Department of Environmental Protection and Department of Marine Resources: Shoreline Sanitary Surveys

The DEP and DMR have conducted shoreline sanitary surveys due to incidents of shellfish contamination. These studies have found that a significant percentage of systems surveyed have problems, including malfunctioning septic systems, straight pipes and other deliberate discharges. DEP has also conducted or coordinated inspections in conjunction with the Small Community Grants (SCG) Program. This program provides cost assistance for eligible homeowners in participating towns to replace malfunctioning systems. Since the program's inception in 1982, $1 million per year has been made available for assistance. As a result, approximately 3,500 systems have been replaced. Requests for participation in the program have been running approximately double the amount available. The DEP received 98 applications totaling $2.6 million in 1997, and 85 applications totaling $2.1 million in 1998.[1]

Department of Environmental Protection: Small Community Grants Program

A review of files from two towns (one on a river and one on a lake) in the SCG Program showed the following:

[1] The bond approved for Small Community Grants in 1999 was reduced to $500,000.

- River Town: 32 requests for assistance; DEP investigation found 28 direct discharges to the river and 2 with failing septic systems, but too far from the water to qualify for the grant
- Lake Town: 76 requests for assistance; DEP investigation found 33 with direct discharges to the water and 20 failing septic systems too far from the water to qualify for the grant.

Problems with systems very often result from a change in use; e.g., a property is sold and the new owner(s) increase the volume of effluent flowing to the system; or use of a property by its current owner increases, such as the case when a camp is converted to year round use, or when a washing machine is installed.

In addition to the above information, anecdotal information from the State Soil Scientist and several local plumbing inspectors also suggests that some lakes may be significantly impacted by untreated effluent reaching the water. However, empirical evidence is not available to document the extent of this problem.

Massachusetts' Inspection Program

Massachusetts is the only state in the nation known to have adopted a mandatory inspection program (Title 5) for subsurface wastewater disposal systems (see Appendix 1). The program became effective in 1995 and requires that all subsurface disposal systems be inspected when a real estate transfer occurs (within 2 years prior to transfer, or 6 months after transfer). Systems that exhibit signs of hydraulic failure, are located extremely close to private or public water supplies or otherwise fail to protect or pose a threat to public health, safety or the environment need to be upgraded under this program.

Process Used to Evaluate Options

Work Group Formation

The Department identified a list of organizations known or expected to have an interest in nonpoint source pollution and the role of buffer strips. Individuals from these organizations were invited to the initial meeting on July 23rd. At that meeting, attendees were asked to identify other groups who were not at the table, but should be invited. Invitations were sent to these organizations as well. Several other individuals also asked to participate and were added to the group. While not all members of the group attended every meeting, all were included on a mailing list and sent periodic updates.

Work Group Participants

Casco Bay Estuary Program, Katherine Groves
Maine Association of Realtors, Linda Gifford
Maine Association of Site Evaluators; Bruce Johnson, David Kamila
Maine Department of Agriculture, State Soil Scientist, David Rocque
Maine Department of Environmental Protection; Don Witherill, Dan Prichard, Bill Noble
Maine Department of Human Services, Division of Health-Engineering; Jim Jacobsen
Maine Municipal Association; Linda Lockhart
Maine Water Utilities Association, Ron Faucher
Northern Maine Association of Code Enforcement Officers, Jim Gardner
Town of Kingfield, Local Plumbing Inspector, Wes Moody
Town of Skowhegan, Code Enforcement Officer & Town Planner, Tom Marcotte
Town of Windham, Code Enforcement Officer Roger Timmons

Work Group Evaluation of Proposals

At the first meeting, the DEP presented a draft proposal for an inspection program developed in consultation with DHS-HE, the State Soil Scientist and representatives from the Maine Association of Site Evaluators. The proposal was to require inspections of shoreland zone property with old (or undocumented) subsurface systems prior to real estate transfer. Work group members voiced the following comments and concerns with respect to such an inspection program:

1. Cannot inspect systems during winter months
2. Liability for Towns (Local Plumbing Inspectors (LPI's)) conducting inspections
3. Availability of LPI's to do inspections
4. Septic systems not a big problem
5. Systems discharging to surface waters don't "fail" in an observable way
6. Liability for Site Evaluators
7. Need to identify and document the problem
8. If systems are a problem, why only transfers?
9. No money to help with inspection and replacement costs
10. Who is responsible for documentation of inspections?
11. Inspections could jeopardize financing (real estate transaction)
12. Mapping not available to show where people need to be concerned
13. Someone might have to replace system that was installed properly at that time
14. What would be required for transfer of leases?
15. Need to put burden back on homeowners; have them make a statement

General agreement was reached among work group members that information is needed documenting the problem, and that any solution should be as simple as possible to administer.

Based on the above comments, the DEP in consultation with DHS-HE and the State Soil Scientist prepared a revised draft which was discussed at a second meeting on September 10th. In the draft, the Department addressed a number of the concerns listed by the members. The proposal still linked the inspection requirement to real estate transfer. Work group members commented that using real estate transfer as the trigger for requiring inspections would miss a number of systems that will not transfer in the near future. Members expressed a preference for an inspection program that would require that all old systems (pre 1974 or undocumented) be inspected within five years. Based on further work group input, another revised draft proposal dated 9/18/98 (see Appendix 2) was circulated to work group members for comment.

Five written comments on the September 18th draft proposal were received. Comments from the Maine Assoc. of Site Evaluators (MASE) Board of Directors, The Government and Political Affairs Committee of the Maine Association of Realtors and Stephen Kasprzak (on mailing list through Maine Homebuilders Assoc.) were opposed to the proposal (see Appendix 3). The common theme in these comments was that the State has not documented that septic systems are a significant threat to surface waters. Several past studies were cited which did not find problems with septic systems. The comments from MASE also expressed concern over potential liability to site evaluators and technical difficulties in carrying out inspections.

Agencies' Response to Comments

On November 2nd, staff from DEP and DHS-Health-Engineering met to discuss the comments received and revisions to the proposal. Staff at the meeting acknowledged that most of the available information concerning the performance of subsurface disposal systems is anecdotal; e.g., Saco River in Buxton, Orr's Island (see Appendix 4). While staff recognize that the majority of old systems would not be considered a problem, experience of several people who conduct inspections gives us reason to believe that in some localities the water quality problem caused by old systems is significant. Nonetheless, given the concerns that have been raised, DEP and DHS-HE have concluded that we should not seek to establish a mandatory inspection program at this time.

DEP and DHS-HE concur that better information is needed for sellers and buyers of property with subsurface systems. In particular, sellers need guidance on what to look for on their property in

determining if there has been a malfunction within 6 months, in accordance with the disclosure requirement currently in Title 30-A, Section 4216 (see Appendix 5). Prospective buyers also need to have a better understanding of what they are buying, whether or not there has been a visible malfunction within 6 months. They should be given whatever information is available on the system, including a copy of the system design if it is available. They should also be made aware of potential problems that could be posed by an old system, especially one located near the water, as well as the potential benefits and limitations of having a professional inspect the system. Any decision to have the system inspected, however, should be voluntary and continue to be left to the parties involved in the transaction.

Recommendations

1. A person selling property with a subsurface disposal system anywhere in Maine (not just in the Shoreland Zone) should be given guidance as to indicators of a malfunctioning system and should be required to provide the buyer with a copy of the wastewater system design (HHE-200 form), if available. If not available, the property owner should provide information to a prospective buyer on the location of the system (septic tank and leachfield), the nature of the system (size and construction material of tank and leach field), and the age of the system, to the extent known. The existing disclosure requirement contained in Title 30-A, Section 4216 should be modified to include this requirement.

2. DEP and DHS-HE should publish an educational brochure for prospective buyers of property with subsurface disposal systems. The brochure should provide information on potential problems with old systems sited near lakes or other surface water.

3. Sellers of property with subsurface disposal systems should also be required to advise prospective buyers prior to signing a contract for sale and purchase of the property that this additional information on Subsurface Disposal Systems is available through DEP or DHS-HE.

4. DEP and DHS-HE should develop a plan for collecting additional data on the performance of subsurface wastewater disposal systems to determine if a mandatory inspection program should be instituted, and if so, what age systems should be included and whether inspections should be limited to Shoreland Zones. DEP and DHS-HE should report back to the Legislature's Natural Resources Committee by January 15, 2000.

Appendix 1 Background Information on Massachusetts' Title 5 Subsurface Disposal System Inspection Program

(Information obtained from Mass. Department of Environmental Protection web site)

Title 5 Q&A: General Information

Q. When did the new rules go into effect?

The section of the rules dealing with approval of alternative technologies went into effect on November 10, 1994. All other provisions took effect March 31, 1995; except for the requirement for the use of an approved Soil Evaluator, which will become effective January 1, 1996. In addition, this past summer a number of interim emergency revisions were made to some of the regulations, with final revisions effective on November 3, 1995.

Q. Who regulates cesspools and septic systems?

Local Boards of Health are the primary regulatory authorities. However, DEP will be involved in a limited number of approvals (for instance, general use of alternative technologies, shared systems and large systems) and some variance requests. In addition, DEP is responsible for overseeing local implementation of Title 5 and provides those bodies with training and technical assistance.

Q. What is the difference between a cesspool and a septic system?

A cesspool generally consists of a pipe, running from a building, which empties into a single component pit. This arrangement does not allow proper detention of solids or proper distribution of effluent. As a result, effluent overloads the capacity of the soil to remove harmful bacteria and viruses, to remove phosphorous, and to convert ammonia. A conventional system, on the other hand, is comprised of: a building sewer; a septic tank, where solids can settle and both the solids and effluent begin to degrade; distribution lines, which prevent effluent from overloading the soil; a soil absorption system, which further treats the effluent by removing harmful bacteria, viruses, phosphorous, and nitrogen; and a reserve area.

Q. Do the new rules require every cesspool to be replaced?

No. Only those cesspools that exhibit signs of hydraulic failure, are located extremely close to private or public water supplies or otherwise fail to protect or pose a threat to public health, safety or the environment will need to be upgraded.

Q. Do the new rules require my system to be inspected?

The new rules generally require systems to be inspected at the time of transfer of property, change of use, or expansion. Systems on condominiums consisting of five or more units must be inspected by December 1, 1996, and then every three years; systems on smaller condominium developments instead may be inspected at time of unit transfer. Shared systems must be inspected annually and large systems by December 1, 1996, and then once every three years. When facilities are divided or combined, inspection is also required. Systems located in cities and towns with comprehensive inspection programs which have been approved by DEP will be required to comply with those local programs rather than the inspection at transfer requirement.

Q. Who conducts a system inspection?

Massachusetts Registered Professional Engineers with a concentration in civil, sanitary or environmental engineering, Massachusetts Registered Sanitarians and Certified Health Officers may perform inspections. Additionally, board of health members and agents, professional home inspectors, licensed septage haulers, system installers, Engineers in Training (EIT certified with a concentration in civil, sanitary or environmental engineering) and persons with at least one year of experience in system inspection all may conduct inspections, provided that they have attended appropriate training and passed a DEP inspectors' exam. DEP has developed a training course for prospective inspectors and has an inspection form for inspections.

Q. How do I have my system inspected if I am selling the house in the middle of the winter?

The regulations require an inspection to be conducted anytime in the two years before the sale, or six months after the sale if weather conditions precluded prior inspection. If, however, the system has been pumped on an annual basis, and the pumping records are available, then the inspection is valid for three years. There may be different requirements if your city or town has a DEP approved inspection program.

Q. What is maximum feasible compliance?

The concept of maximum feasible compliance (MFC) is "do the best you can with what you've got." Wherever feasible, a failed or nonconforming system must be upgraded in full compliance with the rules. But if this is not possible, in many instances, the local board of health is authorized to approve an upgrade that brings the system as close to full compliance as possible, in accordance with certain minimum criteria. In many of those cases, DEP approval would not be needed. Where upgrades are unable to meet basic requirements - for example, minimum groundwater separation (if less than three feet in slow percing soils or less than four feet in fast percing soils) or water supply setbacks (if less than 100 feet from a public water supply or tributary or less than 50 feet from a private water supply), however, variances and DEP review would be required.

Q. What happens if I cannot meet those basic requirements?

If you cannot meet certain basic minimum requirements, you generally will have to apply to the local board of health and to DEP for a variance. The new rules provide a number of options. The use of alternative technologies, for example, which provides better treatment than conventional systems might be a solution in many cases without a variance. Installation of a shared system also could be a feasible solution. Other options also may be available and will be considered on a case-by-case basis.

Q. What alternative technologies are available?

The new regulations provide that recirculating sand filters are approved for general use and composting/humus toilets are approved for general use and in upgrade (remedial) situations. Both uses must be consistent with the conditions in the new Code. In addition, the new Code establishes a comprehensive approach for evaluating and approving other alternative technologies. The Department has issued several Piloting Use Approvals, Provisional Use Approvals, Certifications for General Use and Remedial Use Approvals for additional alternative technologies and continues to review new applications on an ongoing basis. For more information, contact your local Board of Health.

Q. If I own a vacant lot, can I build on it under the new regulations?

Generally, if an individual lot were buildable under the 1978 rules, but a proposed new system could not fully comply with the new rules, you could build up to a three bedroom house, provided that that house size could have been built under the 1978 Code, as long as the application is filed by January 1, 2000, and the system is completed within three years of permit receipt. In some circumstances, a larger house would be allowed, provided that a higher level of treatment (e.g. an RSF) were provided. Longer time frames would apply to certain subdivisions and construction of facilities subject to a M.G.L. c.40B Comprehensive Permit.

Q. Why can't I put my leaching field underneath the driveway?

Impervious areas such as driveways or parking lots restrict air passing through the soils. This causes anaerobic conditions, which, in turn, clog the soil absorption system (leaching field) and may cause it to fail.

Q. What happened to existing local rules when the new state regulations took effect?

Local rules are adopted under independent legal authority. Existing local rules that conflict with or are less stringent than the new code no longer are in effect. Local rules which are more stringent than the new Code will remain in effect, but boards of health are urged to review them and determine whether they are still appropriate.

Q. Do any government agencies provide financial assistance for repairs and/or upgrades?

The federal Farmers Home Administration (FHA) and the Massachusetts Housing Finance Agency (MHFA) offer financing to qualified individuals. For information regarding the federal programs contact your local FHA county office as listed in the phone directory or write:
Farmers Home Administration
U.S. Department of Agriculture
Washington, DC 20250

For information regarding MHFA programs contact:
Massachusetts Housing Finance Agency
One Beacon St.
Boston, MA 02108
(617) 854-1000

Under a new state law, the "betterment law," cities and towns in Massachusetts have the option of providing upfront financing of residential system upgrades. The betterment law allows municipalities to create revolving loan funds to pay for upgrades and to recover costs by assessing betterments on the property tax bills of the homeowners who benefit. For costly upgrades, homeowners may be given up to 20 years to reimburse the city or town for costs, plus interest.

The recently enacted state capital budget included $10 million for the establishment of a program to assist low and moderate income homeowners faced with the prospect of system upgrades. Under this program, grants of up to $100,000 will be given to provide interested cities and towns with some seed money to establish revolving loan programs under the betterment law. Cities and towns are prioritized based on such factors as the percentage of unsewered areas and median household income.

The Department has provided boards of health with details about this program. For additional information, you should contact your board of health or the Department at 800/266-1122.

There also are several legislative initiatives under consideration to provide additional monies to communities to help homeowners upgrade their systems.

THIS DOCUMENT IS INTENDED FOR INFORMAL, INFORMATIONAL PURPOSES ONLY. IN THE EVENT OF ANY CONFLICT OR DISCREPANCY BETWEEN THE INFORMATION CONTAINED HEREIN AND ANY REGULATION OR LAW INCLUDING, BUT NOT LIMITED TO, 310 CMR 15.000, TITLE 5, THE REGULATION SHALL PREVAIL.

Appendix 2 – 9/18/98 Draft Proposal for a Subsurface Disposal System Inspection and Upgrade Program

1. If a building is located in a Shoreland Zone as defined by the municipality and utilizes a subsurface wastewater disposal system, the system must be inspected for likely contamination of nearby surface water prior to any transfer of property ownership or by October 1, 2004, unless evidence exists that the system is located completely outside of the Shoreland Zone as follows:

a. If a system was installed prior to July 1, 1974 or is undocumented and is less than 100 feet from the normal high water line, an inspection must be completed by a Licensed Site Evaluator (LSE), , Certified Soil Scientist or Certified Geologist and include an evaluation of the system based on both surface and subsurface conditions. A property which has previously been transferred and had an inspection done under this program is not required to have another inspection.

2. Where a subsurface investigation is required, it shall be made in the area of the septic tank and disposal field. If the exact location of the subsurface system is unknown, the investigation shall be made in the area that the Site Evaluator , Certified Soil Scientist or Certified Geologist concludes is most likely to be the system location.

3. An investigation of subsurface conditions shall include a determination as to whether or not there is a reasonable likelihood that there is a direct connection between the subsurface wastewater disposal system and the waterbody, via either surface or subsurface flow. Evidence that there is a direct connection to a waterbody includes, but is not limited to the following:

a. The bottom of the disposal area is resting on top of bedrock;

b. The separation distance between the bottom of the disposal area and bedrock is less than 6 inches and no biomat is found at the bottom of the disposal area;

c. The soil is coarse sand or gravel and no biomat exists at the bottom of the disposal area;

d. The disposal area is located on fill soil with significant amounts of debris such as woody material that will allow the channeling or "piping" of effluent through it (this can be rectified by replacing some of the fill and may not require a complete replacement system).

e. The disposal area is located on coarse sand or gravel fill over poorly drained soil such that the effluent is traveling through the fill and not infiltrating into the original soil.

f. The disposal system connects to foundation or curtain drains, cross culverts or ditches.

g. The septic tank is not constructed of pre-cast concrete or other material in conformance with the current Subsurface Wastewater Disposal Rules, and is located on shallow-to-bedrock soil or coarse sand or gravel, unless testing of the tank shows that it is intact and does not leak.

Note: Lack of a biomat under a system may in some cases be due to lack of use of the system, especially for seasonal camps. In situations, where a system has received little use, site evaluators should consider the likelihood that a biomat would form with increased use.

4a. Upon transfer of ownership of property, or by October 1, 2,004, , using a form approved by DEP/DHS Div. of Health-Engineering, documentation must be provided by the property owner to the municipality that the property has been inspected in accordance with the standards of this section, and that the inspector has concluded that a direct connection is not likely to exist between the subsurface wastewater disposal system and the waterbody.

4b. Where the Site Evaluator, Certified Soil Scientist or Certified Geologist concludes that there is likely a direct connection between the subsurface wastewater disposal system and the waterbody, corrective action approved by the LPI must be taken in accordance with the Maine Subsurface Wastewater Disposal Rules.

Appendix 3 – Comments Received on 9/18/98 Proposed Inspection Program

E-Mail Comment from Maine Association of Realtors:

From: Linda Gifford[SMTP:LGifford@CMETitle.com]
Sent: Wednesday, October 28, 1998 11:43 AM
To: Witherill, Don T
Cc: 'Cindy Butts'; 'Joan'; 'Ed Suslovic'
Subject: RE: Revised Draft: Subsurface Disposal System Inspections

Don-

The Government and Political Affairs Committee of the Maine Association of REALTORS met last Friday. We talked about your draft proposal which I had distributed to the members, as well as the questionnaires which we received from our members at the convention two weeks ago. The consensus was that we would oppose the inspections from the standpoint of there being no demonstrated need for them to take place. It is an unwarranted intrusion, expense and hassle for the homeowners affected, without there being any statistical data to suggest that the shoreland zone septics are creating a problem. Furthermore, if a system is a problem, the LPI already has legal and statutory authority to force corrections, without this new law taking place. It seems like the law is overkill for a problem which doesn't exist.

Please let me know what the next steps that you are taking will be.

Linda

Appendix 4 – Newspaper Articles Documenting Recent System Failures

Appendix 5

Title 30-A, § 4216

§ 4216. Transfers of shoreland property Any person transferring property on which a subsurface waste water disposal system is located within the shoreland area, as defined in Title 38, section 435, shall provide the transferee with a written statement by the transferor as to whether the system has malfunctioned during the 180 days preceding the date of transfer. [1989, c. 6 (amd); c. 9, §2 (amd); c. 104, Pt. A, §43 (rpr); c. 104, Pt. C, §§8, 10 (amd).]

Section History:
1987, c. 737, § A2,C106 (NEW). 1989, c. 104, § A43,C10 (RPR). 1989, c. 104, § C8,C10 (AMD). 1989, c. 6 (AMD). 1989, c. 9, § 2 (AMD).